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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/507,536

03/08/2005

Theodor Graser

10191/3810

1368

26646 7590 04/11/2008

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EXAMINER

DINH, BACH T

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

04/11/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/507,536	<b>Applicant(s)</b> GRASER ET AL.	
	<b>Examiner</b> BACH T. DINH	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/13/2004</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Summary***

1. This is the initial Office Action based on the 10/507,536 application filed on 09/13/2004.
2. Claims 13-26 are currently pending and have been fully considered.

### ***Claim Objections***

3. Claims 14-17, 29 and 23-25 are objected to because of the following informalities:
  - a. On line 1 of claims 14-17, 19 and 23-25, "1" is believed to be misspelling of "13".
  - b. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 13-14, 16, 19-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Maurer et al. (US 4,294,679).

Addressing claim 13, in figure 3 Maurer discloses a sensor element (41),  
comprising:

A first layer (52);

A second layer (46); and

At least one contact face (electrode 50 and heating element 49) disposed in a layer plane (layer of electrode 50 and 49 between layers 52 and 46) between the first and second layers, the first layer include a recess (layer 52 is shorter than layer 46) in a region of the at least one contact face (electrode 50 and heating element 49 are exposed at the terminal region of layer 46 to permit an electrical connection (5:3-6, 6:4-7)).

Addressing claim 14, Maurer discloses that the sensor element is configured to detect one of a concentration of a gas component (1:11-16) and a temperature (7:35-38) of an exhaust gas of an internal combustion engine.

Addressing claim 16, the sensor of Maurer has recess extends in the region of the at least one contact face over an entire width of the sensor element (figure 3).

Addressing claim 19, the sensor of Maurer further comprises (figure 3):

An electric element (electrode 50 or heating element 49) and a conductor tract (conductive tracts of the electrode 50 and heating element 49) arranged inside the sensor element, wherein at least one contact face is electrically connected to the electrical element via the conductor track (the end of the conductive tracts are exposed to permit an electrical connection (5:3-6) and the exposed portion is connected to the sensing portion of electrode 50 and heating portion of heating element 49).

Addressing claim 20, Maurer discloses in figure 3 that the at least one contact face is electrically connected to one of an electrode (the exposed conductive tract of electrode 50) and a heating element (the exposed conductive tract of the heating element 49).

Addressing claim 21, the sensor element of Maurer further comprising:

A first electrical insulation layer (insulating cover layer 51, 7:62-63) arranged between the conductor track and the first layer, and including a recess (insulating layer 51 has the same length as cover plate 52 and is shorter than the electrolyte body 46, figure 3) in the region of the at least one contact face;

A second electrical insulation layer (electrically insulating layer 47, 7:58-61) arranged between the conductor track and the second layer, and between the at least one contact face and the second layer (figure 3).

Addressing claim 22, Maurer discloses that the conductive tracts are exposed to permit an electrical connection (5:1-6, 6:4-7).

Therefore, Maurer discloses a contact part (electrical connection) electrically connected to the at least one contact face (exposed conductive tracts) so that the electrical element (sensing portion 50 and heating portion 49), via the conductor track, the at least one contact face, and a contact part, is connected to the electrical wiring located outside the sensor element (5:1-6, 6:4-7).

Addressing claim 23, the sensor element of Maurer further comprising (figure 3):

A third layer (42), wherein there is a further contact face (exposed portion of electrode 45) arranged in a layer plane (layer of electrode 45 between layers 46 and 42) between the second and third layers, and the third layer includes a recess in a region of the further contact face (layer 42 is shorter than electrolyte body 46; therefore, forming a recess that exposes the conductive tract of electrode 45).

Addressing claim 24, Maurer discloses the first layer (cover plate 52) forms an outer layer of the sensor element (the grooves of cover plate 52 provides a predetermined passage for oxygen molecules in the measuring gas (8:5-11)).

Addressing claim 25, Maurer discloses the sensor element further comprising (figure 3):

At least one further layer (47) which is arranged on the side of the first layer that is remote from the at least one contact face, and which includes additional recess (window 48).

6. Claims 13, 16, 19, 21, 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kojima et al. (US 5,110,442).

Addressing claim 13, in figure 5b, Kojima discloses a sensor element for detecting a physical property of one of a gas and a liquid, comprising:

A first layer (8);

A second layer (1);

At least one contact face (3) disposed in a layer plane (lead 4) between the first and second layers, the first layer including a recess (layer 8 is shorter than 1 therefore the end of lead 4 is exposed, figure 5a) in a region of the at least one contact face.

Addressing claim 16, Kojima discloses that the recess extends in the region of the at least one contact face over an entire width of the sensor element (figure 5a).

Addressing claim 19, Kojima discloses an electric element (electrode 3) and a conductor track (lead layer 4) arranged inside the sensor element (figure 5b), wherein the at least one contact face (exposed portion of lead 4 in figure 5a) is electrically connected to the electrical element via the conductor track.

Addressing claim 21, the sensor of Kojima further comprising (figure 5b):

A first electrical insulation layer (alumina porous protective layer 9) arranged between the conductor track and the first layer, and including a recess in the region of the at least one contact face (layer 9 is shorter than electrolyte body 1); and

A second electrical insulation layer (insulating protective layer 8) arranged between the conductor track and the second layer, and between the at least one contact face and the second layer.

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Addressing claim 23, the sensor element of Kojima further comprising (figure 5b):

A third layer (additional layer 8 on the opposite side of electrolyte body 1), wherein there is a further contact face (electrode 4) arranged in a layer plane (lead 4) between the second and third layers, and the third layer includes a recess (additional layer 8 is shorter than electrolyte body 1) in a region of the further contact face.

Addressing claim 24, the first layer 8 of Kojima forms an outer layer of the sensor element (figures 5a and 5b).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.



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9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maurer et al. (US 4,294,679).

Addressing claim 15, in figure 3 Maurer discloses that the first (aluminum oxide cover plate 52) and second (zirconium dioxide electrolyte body 46) are ceramic substrate layers.

Maurer fails to disclose the thickness of electrolyte body 46 and cover plate 52.

Maurer discloses in another embodiment the electrolyte body 0.8 mm (4:31-44) and cover plate 52 has grooves with depth of 20  $\mu\text{m}$  (8:1-6).

At the time of the invention, one with ordinary skill in the art would have been motivated to modify the second embodiment of Maurer to have the electrolyte body with thickness of 0.8 mm and the cover plate with thickness more than the depth of the grooves because the cover plate must be thicker than 20  $\mu\text{m}$  (8:1-6) to support the grooves and provide structural integrity to the sensor. Therefore, one with ordinary skill in the art would have arrived at the claim thickness when fabricating the sensor of Maurer.

10. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maurer et al. (US 4,294,679) in view of Muller et al. (US 4,334,974).

Addressing claim 17, Maurer fails to disclose the recess of the sensor element has a slotlike-shaped recess.

Muller discloses an electrochemical sensor in figure 2; wherein, the sensing electrode 33 and conductive strip 33 is covered by a porous cover 34 that has a

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slot opening at the terminal portion so the conductive strip 33 can be contacted by suitable contacts (5:11-19).

Maurer and Muller are analogous arts for they disclose sensor element. At the time of the invention, one with ordinary skill in the art would have been motivated to modify the sensor of Maurer by fabricating a slot opening on the cover plate 52 like that of Muller because the porous cover 34 protects the connective strip and sensing electrode against the corrosive influence of gases as well as providing contact surface for the electrode (Muller 5:11-15).

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maurer et al. (US 4,294,679) in view of Muller et al. (US 4,334,974) as applied to claim 17 above, and further in view of Liang (US 2002/0164897).

Addressing claim 18, Maurer and Muller fail to disclose the slotlike-shaped recess widens toward the outer face of the sensor element.

Liang discloses terminal connector (figure 1); wherein, the terminal connector has a Y-shaped opening 21 and meanderline slot 22 communicates with the opening 21. The wire is guided through the slot 22 via opening 21 [0021].

At the time of the invention, one with ordinary skill in the art would have been motivated modify the slot opening of Muller with a Y-shaped opening like that of Liang because the Y-shaped opening would guide the contacts to the conductive strip of the sensing electrode.

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12. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maurer et al. (US 4,294,679) in view of Kojima et al. (US 5,110,442).

Addressing claim 26, Maurer discloses a method for producing a sensor element constructed in layers for detecting a physical property of one of a gas and a liquid, the method comprising (figure 3):

Forming a first layer of the sensor element (cover plate 52, 8:28-31);

Forming a second layer (electrolyte body 46, 4:31-34) of the sensor element, so that at least one contact face (electrode 50 and heating element 49, 7:58-61)) is disposed in a layer lane between the first and second layers; and

Forming, in the first layer, a recess (layer 52 is shorter than layer 46) in a region of the contact face (the exposed region of electrode 50 and heating element 49 for establishing electrical connection, 5:3-6).

Maurer further discloses that cover plate 52 is made of aluminum oxide, which is a ceramic material.

Maurer fails to disclose forming the recess by one of stamping, drilling, and milling the recess in a green body of a ceramic sheet.

Kojima discloses cutting, which is equivalent to milling, green material into plate-like bodies for forming electrolyte for sensor element (9:64-10:3).

Kojima and Maurer are analogous art for they disclose sensor element with electrolyte body. At the time of the invention, one with ordinary skill in the art would have been motivated to modify the cover plate of Maurer by cutting it shorter than the electrolyte body because using the cutting method would allow one to control the dimension of the cover plate (Kojima 10:1-3).

13. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima et al. (US 5,110,442).

Addressing claim 26, Kojima discloses the method for producing a sensor element constructed in layers for detecting a physical property of one of a gas, the method comprising:

Forming a first layer (alumina protective layer 8) of the sensor element;

Forming a second layer (electrolyte body 1) of the sensor element, so that at least one contact face (electrode 3) is disposed in a layer plane (lead 4) between the first and second layers; and

Forming, in the first layer, a recess (layer 8 is shorter than electrolyte body 1, figure 5a) in a region of the contact face.

Kojima discloses cutting, which is equivalent to milling, the green material into plate-like body with a particular dimension (10:1-3).

Kojima fails to disclose forming the recess by stamping, drilling and milling the recess in a green body of a ceramic sheet.

At the time of the invention, one with ordinary skill in the art would have been motivated to modify protective layer 8 by cutting it into a plate that is shorter than the electrolyte body 1 because such modification would allow the exposure of lead 4 in the retaining portion of the sensor element (14:63-15:2).

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***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BACH T. DINH whose telephone number is (571)270-5118. The examiner can normally be reached on Monday-Friday EST 7:00 A.M-3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/  
Supervisory Patent Examiner, Art Unit  
1753

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04/09/2008